

Assimilation and Accommodation Speed Detection of The Seventh Grade Students in Learning Special Triangle

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Abstract

Each student as an individual is born with different abilities, so is the time to absorb and process the information received. Students with high ability, medium, and low have different speeds in analyzing the acquisition of new information or knowledge. There are either the need of short time or long time to acquire it. When students absorb, process, and analyze such information, they have to adapt the form of assimilation and accommodation in the cognitive structure. This study aims to detect the speed of assimilation and accommodation of the seventh grade students who are capable of high, medium, and low in special learning triangle. It used a qualitative approach. The instruments research used were task-based interview and stopwatch. In this task-based interviews, researchers interviewed subjects using interview guide had been compiled and tested. The questions in the form of interview guidelines posed to guide students in doing task given as a way of recording the speed of the process of assimilation and accommodation. Each task was given to the subject matters triangle containing new concepts such as the properties of special triangles, special triangles stripes, painting stripes triangles and special triangles, count the number of corners and the outer corner of the triangle special, and counting comprehensive special kinds of triangles. Other instrument of research was stopwatch used to detect the speed of assimilation and accommodation of each student. The data analysis was done in three stages; transcription, data reduction, and coding. The results of three schools examined showed that group of high-ability students detected more quickly in the process of assimilation and accommodation for accomplishing- four tasks on the triangle than medium and low ability students.

1. Introduction

Adaptation is adjusting to the environment. The way of adaptation differs from one student to another students. The adaptation is done through two processes, namely assimilation and accommodation are often contradictory, but the two processes can not be separated (Hudojo, 2001: 60). From research showed that students can learn not only from what was known (could not just rely on assimilation), but also they studied in situations where the presence of cognitive structures were not used (the case of accommodation). Through these two kinds of adaptation, students integrated new experiences based on the duration of the experienced. Adaptation is an equilibrium (equilibrium) of assimilation and accommodation, both of which match the internal structure of the environment.

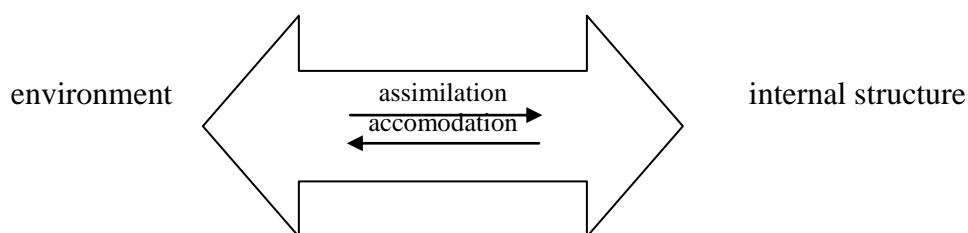


Figure 2.1 Linkages assimilation and accommodation (Source: Labinowicz, 1980:32)

The qualitative approach implemented in this study describing the process of assimilation and accommodation in a special triangular learned how to form mental framework and how to combine information (Ackles & Sherin, 2004). The process of forming a mental framework began with activating existing schemes, differentiating and categorizing. The process of combining information was to adjust (assimilation) and to change or modify (the accommodation) existing schema. Researcher used this thinking process in learning a special triangle and in such manner or a more complex way was a clear indication that there were assimilation and accommodation which is formed by the thinking process.

The seventh grade students of junior high school was chosen as the subjects because the students should be able to think logically and used concrete operations to establish operations more completely.

The process of data collection in this study was done by using a task-based interviews (Goldin, 2005: 15). The techniques used are clinical interviews and recorded through microcassette recorder. The clinical interview was used to capture information about the description of assimilation and accommodation as the subject material and asked to draw further conclusions. In broad outline the steps for task-based interview were students had to do the task. During completing the task, subjects were interviewed clinically to dig about what, how and why related to the task and the results as well as other possibilities that arose from the impact of questions.

In this study, analysis of data used three stages; analyzing transcription of data, data reduction, and coding (Moleong, 1991: 71). Interview transcripts analyzed using microcassette recorder. Furthermore, irrelevant data was reduced by using the framework of thinking proces of assimilation and accommodation began with forming a mental framework until combining information. The last step was the coding of each school namely the categorization of the first, second, and third school. While the coding of each student namely the categorization of students with high, medium, and low capabilities.

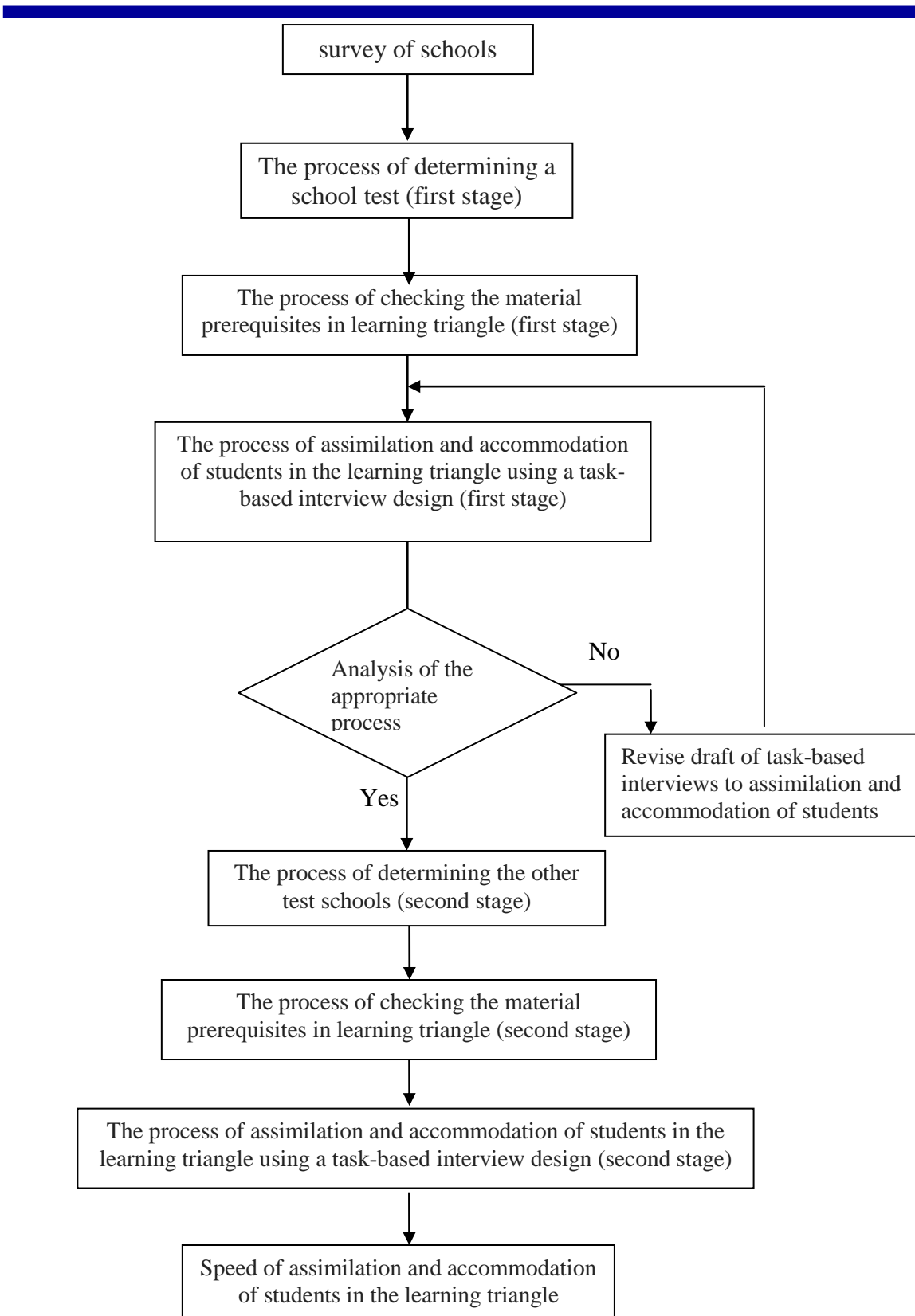


Figure 2.2. *Flow chart of designing activities*

The study began by surveying SMP 16 Surabaya, SMP 17 Surabaya, and SMP 18 Surabaya. Further study was done to see the condition of the students, teachers, facilities and related infrastructure to determine the process of determining a school test on the first stage.

After the process of determining a school test, then the process is carried out to check the material prerequisites in learning the triangle. The process begins with a teacher interview guide for subsequent interviews conducted for teachers who teach the class about triangle material. This is done because the teacher knows more about the material prerequisites that have been understood by students of the learning activities performed.

Next step is the process of assimilation and accommodation of students who express symptoms adapted to form a cognitive structure as a whole and in accordance with the context of everyday life. Activities undertaken in this study begins with the manufacture of the interview guidelines and tasks. Preparation of interview guide and duties are interrelated because the interview questions posed to the students aims to guide students in doing the task and to learn about how assimilation and accommodation of students in understanding the task to complete the task.

In conducting the interview with the student, along with observing the activities of student activity and accompanied by a recording speed start reading assignments to complete tasks with a stopwatch. This activity was the quest for the meaning of such symbolic reality of what is thought and what is understood, to find the basic idea behind the description of assimilation and accommodation to the students' cognitive structures. The position of the researcher is an active participation as an observer because the researchers directly involved in the research process in the field during record all student activity.

Further analysis is done according to the standard process of assimilation and accommodation activities after interviews. This activity was to interpret the relationship between the various facts, occurrences, events, and responses were found to discover principles and true meaning. This activity begins by examining the transcription of the data obtained from the results of microcassette tape recorder to write down on a sheet of transcription, then perform data reduction by storing and sorting interview questions and answers that are not showing the process of assimilation and accommodation of students appropriate mental framework, and the latter is the coding (encoding) for the process of assimilation and accommodation of students, for each student, and for each school in doing each task as outlined in the flow chart.

From the analysis conducted, if there are still a lot of inconsistency with the mental framework, then carried back repetition of the process of assimilation and accommodation at the same school also students of high, medium, and low capability are the same anyway. This is done to determine whether if the repetition, the students form a mental framework remained the same or different from the previous.

But if there is a match with the mental framework framework, it will be back in the assimilation and accommodation at two different schools and students of high, medium, and low ability. This is done to determine whether if done in the schools and students who are different then the formation of a mental framework remains the same whether or different. Two different schools is also determined through the process of determining the second phase of the test schools by looking at aspects of the condition of the student, teacher conditions, school environment, as well as related infrastructure.

In the same way as in the first stage, then the process is carried out to check the material prerequisites in learning the triangle by conducting interviews with the class teacher. Then check the process of assimilation and accommodation of students and analyzed in accordance mental framework in order to get information about speed of assimilation and accommodation in the seventh grade students learn special triangle.

2. Result and Discussion

Research begins with a survey of the schools that eventually establishes 18 as the junior high school first test. Next step is the process of checking the material prerequisites in learning the triangle. The process begins with a teacher interview guide for subsequent interviews conducted for teachers who teach the class about triangle material. This is done because the teacher knows more about the material prerequisites that have been understood by students of the learning activities performed.

In the presentation of the results of a task-based interview for students there is a code that indicates the SM-18, SMP 18 Surabaya, code SM-17, which shows the SMP 17 Surabaya, code SM-16, which shows the SMP 16 Surabaya, T1 code shows high ability students with a number 1, S2 code indicating the student capable of being the number 2, and R3 code indicates a low ability students with number 3.

From interviews with teachers showed that the teacher has made the process of checking the material is generally a prerequisite to students in every lesson so learning the triangle, the students already have prior knowledge in learning the triangle privileged material in junior high school level. With this result, the interview can be conducted on students of class VII-E the next day based tasks that have been designed by researchers. The task is made consists of the first tasks triangle special properties, the second task of counting the number of corners and outside corners special triangle, the third task of painting triangles and lines of special triangles, and the fourth task of calculating the area of a variety of special triangles.

T26 enable the scheme to the activity of a large measure angles and lengths of the sides of a triangle using a protractor and a ruler. He knows that in order to determine the angle of the measurement because he was not able to determine a large angle without measuring. He used a protractor where the measurement starts from 0° of one of the lines that flank the corner according to the learned in elementary school. Another activity is to measure the length of the side on the same side of the triangle to determine the length and unequal length, and distinguish each triangle, so as to categorize the nature of the triangle. He also enables the scheme to classify the activity acute triangle, obtuse, and right-angled. He distinguishes the triangle by its angle so big he can categorize the types of triangles based on angle is acute triangle, obtuse triangles, and right triangle. Another activity was that grouping is the isosceles triangle, equilateral triangle, and any triangle. He distinguished based on the long side of the triangle so that he can categorize the types of triangles based on sides is isosceles triangle, equilateral triangle, and any triangle.

T26 enable the scheme when he saw a triangle with two sides of unequal length and one angle equal to 90° . He can categorize the two sides are not the same length as any side and one angle equal to 90° as a right angle. He adjusts his scheme of the properties of a right triangle. He thinks that there is a right-angled triangle the sides are not upholding the same length and have the same length.

T26 enable the scheme when he saw a triangle with all sides the same length and all angles equal to 60° . He can categorize all sides the same length as the equilateral

sides and all angles equal to 60° as an acute angle. He adjusts his scheme of the properties of equilateral triangles. He thinks that there equilateral triangle whose sides are equal in length and all four corners as great.

For the second task, the current scheme T26 was enable large measure angles and angle summation. He distinguished triangles angular amount equal to 180° , the amount of the angle is less than 180° , and the amount of the angle is more than 180° . Then he repeated measurements because of him remembering and knowing in advance the time in elementary school that the angle of triangle was 180° . He adjusts his scheme of the angles of a triangle is 180° . He modified the scheme of the various triangles so he concluded that the acute angle of a triangle is 180° , the number of triangles obtuse angle is 180° , the amount of any triangle angle is 180° , the angles of a right triangle is 180° , the amount of angle isosceles triangle is 180° , and the number of equilateral triangle angle is 180° .

For the third task, activates T26 scheme of the existing lines in the triangle. He categorizes the high line forming a right angle with the sides of the triangle. He recalled that the high line equal to the height of triangle, the triangle can also be made by other high line if formed from a vertex of the other triangle. He adjusts the scheme that the high line is a line that can be made from a vertex perpendicular to the sides of the triangle. He also said that the high line triangle there are three that can be made from each vertex of the triangle to the side in front of him.

T26 enable the scheme on the lines existing in the first triangle by measuring the angle with a protractor large. He categorizes the line for the corner of a triangle divides the triangle into two equal parts. He recalled that the line formed by the vertex and divides equally large angles. He adjusts scheme that line for a line that can be made from the side to the vertex angle of the triangle and divide equally great. He also said that there are three lines for the triangle which can be made from each vertex of the triangle to the side in front of him.

T26 enable the scheme on the lines existing in the first triangle by measuring the angle with a protractor large. He categorizes the line for the corner of a triangle divides the triangle into two equal parts. He recalled that the line formed by the vertex and divides equally large angles. He adjusts scheme that line for a line that can be made from the side to the vertex angle of the triangle and divide equally great. He also said that there are three lines for the triangle which can be made from each vertex of the triangle to the side in front of him. T26 enable the scheme on the lines existing in the first triangle by measuring the angle with a protractor large. He categorizes the triangle heavy line divides the triangle into two parts of equal length. He recalled that the heavy line formed from the vertex and divides the side in front of the same length. He adjusts scheme that heavy line is a line that can be made from the vertex to the side of the triangle and divide each long side. He also said that there are three triangular heavy lines that can be made from each vertex of the triangle to the side in front of him.

For the fourth task, activates T26 scheme of the base and height of triangles and considering the area of the triangle. He categorizes the area of the triangle is obtained from the base and height of the triangle. He recalled that the area of a triangle is calculated from the base and height of the triangle. He adjusts scheme that area of the triangle is the product of the base and height of the triangle divided by two.

3. Conclusion

Based on the results that have been achieved, then the test of the first schools that SMP 18 Surabaya can be concluded that group of high-ability students are detected quickly in the process of assimilation and accommodation complete four tasks on the triangular T26 (10 minutes 32 seconds), T9 (12 minutes 10 seconds), T14 (13 minutes 40 seconds), and T16 (14 minutes 21 seconds). From interviews with group of medium ability student, the student successively detected quickly in the process of assimilation and accommodation complete four tasks on the triangle S25 (12 minutes 30 seconds), S3 (12 minutes 50 seconds), S10 (13 minutes 40 seconds), S30 (14 minutes 21 seconds), S2 (15 minutes 10 seconds), S13 (15 minutes 25 seconds), S32 (16 minutes 10 seconds), S12 (18 minutes 10 seconds). From interviews with low groups, the student successively detected quickly in the process of assimilation and accommodation complete four tasks on the triangle R29 (20 minutes 5 seconds), R35 (20 minutes 30 seconds), R21 (20 minutes 49 seconds), R18 (22 minutes 31 seconds).

From these results, there is compliance with the framework of the mental framework, then re-do the process of assimilation and accommodation at two different schools to the high, medium, and low-ability students.

In the second test school that was SMP 17 Surabaya can be concluded that successive groups of students quickly detected high in the process of assimilation and accommodation complete four tasks of the triangle is T18 (9 minutes 32 seconds), T2 (10 minutes 12 seconds), T6 (10 minutes 40 seconds), T8 (10 minutes 51 seconds), T10 (11 minutes 12 seconds), T12 (11 minutes 42 seconds), T15 (11 minutes 52 seconds), T27 (12 minutes 2 seconds), T35 (12 minutes 15 seconds), and T36 (12 minutes 35 seconds). From interviews with the middle group, the student successively detected quickly in the process of assimilation and accommodation complete four tasks on the triangle S19 (12 minutes 40 seconds), S5 (12 minutes 43 seconds), S7 (12 minutes 50 seconds), S14 (12 minutes 55 seconds), S17 (13 minutes 10 seconds), S19 (13 minutes 13 seconds), S23 (13 minutes 20 seconds), S25 (13 minutes 25 seconds), S26 (13 minutes 35 seconds), and S31 (13 minutes 48 seconds). And the low group of student successively detected quickly in the process of assimilation and accommodation complete four tasks on the triangle R34 (15 minutes 5 seconds), R32 (15 minutes 35 seconds), R11 (16 minutes 10 seconds), R16 (18 minutes 31 seconds), R21 (18 minutes 45 seconds), R22 (19 minutes 15 seconds), R24 (19 minutes 49 seconds), R32 (20 minutes 10 seconds), and R 33 (20 minutes 45 seconds).

Next, the third test school that was SMP 16 Surabaya can be concluded that successive groups of students quickly detected high in the process of assimilation and accommodation complete four tasks on the triangular T33 (10 minutes 12 seconds), T35 (10 minutes 20 seconds), T3 (11 minutes 10 seconds), T1 (11 minutes 22 seconds), T9 (11 minutes 45 seconds), T20 (11 minutes 49 seconds), T26 (11 minutes 57 seconds), T7 (12 minutes 5 seconds), and T12 (12 minutes 23 seconds). From interviews with the middle group, the student successively detected quickly in the process of assimilation and accommodation complete four tasks on the triangle S11 (12 minutes 37 seconds), S32 (12 minutes 39 seconds), S36 (12 minutes 47 seconds), S25 (12 minutes 59 seconds), S30 (13 minutes 11 seconds), S4 (13 minutes 25 seconds), S17 (13 minutes 37 seconds), S2 (13 minutes 48 seconds), S22 (13 minutes 52 seconds), S27 (13 minutes 56 seconds), S11 (14 minutes 5 seconds), S29 (14 minutes 12 seconds), S24 (14 minutes 22 seconds), S16 (14 minutes 27 seconds), S15 (14 minutes 39 seconds), S19 (14 minutes 41 seconds), S38 (14 minutes 45 seconds), S13 (14 minutes 49 seconds), S8 (14 minutes

57 seconds). And the low group, the student successively detected quickly in the process of assimilation and accommodation complete four tasks on the triangle R5 (16 minutes 15 seconds), R21 (17 minutes 20 seconds), R37 (17 minutes 49 seconds), R34 (18 minutes 31 seconds), R28 (18 minutes 47 seconds), R31 (18 minutes 55 seconds), R14 (19 minutes 7 seconds), R18 (19 minutes 37 seconds), R6 (19 minutes 40 seconds), R10 (19 minutes 53 seconds).

Acknowledgements The author would like to thank his colleagues for their valuable comments and input.

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